PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P26453PC00/PJE	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/NL 03/00948	International filing date *(day/month/year)* 30.12.2003	Priority date *(day/month/year)* 31.12.2002
International Patent Classification (IPC) or both national classification and IPC A23C21/00		
Applicant CARLISLE PROCESS SYSTEMS B.V. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
21.07.2004	29.03.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Heirbaut, M Telephone No. +49 89 2399-8642

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/NL 03/00948

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-24 as originally filed

Claims, Numbers

1-18 received on 30.12.2004 with letter of 28.12.2004

Drawings, Sheets

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

   see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-17
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-17
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-17
	No:	Claims	

2. Citations and explanations

   see separate sheet

I

1 The amended set of claims does not meet the requirements of Art. 34(2)(b) PCT, as it introduces subject-matter which extends beyond the content of the application as originally filed. There is no support in the application as originally filed for the feature:

a. "for a time between 5 seconds and 900 seconds" in amended claim 1, as the application as originally filed discloses this feature only within the context of the description of figure 1 (page 18 line 3), which refers to a specific embodiment (eg dry matter content of 6%, pasteurisation between 75 and 90°C, concentration to 60-70% dry matter etc.), the generalisation of which is not allowable.

b. the subject-matter of present claim 2, which is only disclosed in combination with the features of claim 1 as originally filed, but to which there is no reference in present claim 2.

This opinion has been established as if the above mentioned amendments had not been made and is therefore based on the application as originally filed (Rule 70.2 (c) PCT).

V

1 Reference is made to the following prior art documents (D):

D1: US-A-2 661 294
D2: US-A-6 048 565
D3: WO-A-02 087 348

2 The subject-matter of present independent claim 1 (method) meets the requirements of novelty (Article 33(2) PCT).

None of the prior art documents cited in the international search report teaches the subject-matter having the combination of features indicated in said claim, in particular the features (1) a whey concentrate with a dry matter content of at least 45%; (2) finely dispersing the whey concentrate; (3) a heating step in which the whey concentrate is held at a temperature of at least 75°C for a time of between 0.25 and 5 minutes.

3 The subject-matter of present independent claim 13 (device) meets the requirements of novelty (Article 33(2) PCT).

None of the prior art documents cited in the international search report teaches the subject-matter having the combination of features indicated in said claim, in particular the features (1) a spray drying device; and (2) feed means comprising heating means designed to hold the whey concentrate at a temperature of at least 75°C for between 0.25 and 5 minutes.

4 The subject-matter of the present application meets the requirements of inventive step (Article 33(3) PCT).

Document D1, which is considered to represent the closest prior art, teaches a process for the production of stable nonhygroscopic whey powders, in which liquid whey is concentrated by evaporation to 50-60% solids, followed by crystallisation by cooling of at least 50% of the lactose in the concentrate as small solid particles of lactose monohydrate dispersed in the concentrate, followed by atomising employing a drying gas, such as hot drying air (see in particular claims 3-5; column 4 lines 1-18 in D1).

The subject-matter of the present application differs from the teaching of document D1 in the heating step in which the whey concentrate is held at a temperature of at least 75°C for a time of between 0.25 and 5 minutes (claim 1) and the feed means comprising heating means which are designed to hold the whey concentrated at a temperature of at least 75°C for a time of between 0.25 and 5 minutes (claim 13).

The technical problem facing the skilled person at the priority date of the present application was to provide a method and device for the preparation of whey powders

with reduced stickiness and caking problems (see page 4 column 1 of the present description).

The solution of this technical problem, by employing the heating step in which the whey concentrate is held at a temperature of at least 75°C for a time of between 0.25 and 5 minutes (claim 1), and a device in which the feed means comprise heating means which are designed to hold the whey concentrated at a temperature of at least 75°C for a time of between 0.25 and 5 minutes (claim 13), was not obvious with regard to prior art document D1, in which no such heating step is advocated. Moreover, significantly reduced caking of the end product is achieved, which allows the use of bag filters instead of cyclones for drying gas filtration.

Prior art document D2 teaches the combination of a secondary stream to be mixed with the main stream of initially cooled whey concentrate, but no initial heating step. Prior art document D3 teaches the use of flash evaporation at preferred temperatures of 80-96°C, during which the heating time is shorter than in the present application, and cannot be precisely set. Hence, the present application provides an alternative solution of the technical problem with regard to prior art documents D2-D3.

The other cited prior art documents, either alone or in combination with D1, D2 or D3, do not render the subject-matter of the present application obvious.

5 Dependent claims 2-12 and 14-17 disclose particular embodiments of the independent claims referred to above, and meet the requirements of novelty and inventive step as well.